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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/762,391

Applicant(s)

BU ET AL.

Examiner

AVI GOLD

Art Unit

2457

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 and 27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 7/8/10
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This action is responsive to the amendment filed May 21, 2010. Claims 1, 6, 10, 12, 15-19, 22, 23, and 27 were amended. Claim 26 was canceled. Claims 1-25 and 27 are pending.

Response to Amendment

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 22 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. While the specification discloses probing interval times, it does not disclose using a first, second, and third timing for probing nodes based on their ranking, along with a first, second, and third interval between probes, with the second interval being longer than the first interval and the third interval being longer than the first interval.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims are rejected under 35 U.S.C. 103(a) as being unpatentable over Bornstein et al., U.S. Patent Application Publication No. 2002/0163882, further in view of Varadarajan et al., U.S. Patent Application Publication No. 2004/0255323.

As to claim 1, Bornstein teaches an overlay network for maintaining traffic flow between a client and a server during a denial of service attack, comprising: a set of overlay nodes, coupled between the client and the server, wherein each overlay node comprises:

a ranking module configured to rank the overlay nodes based on a performance metric, wherein an overlay node with a higher-ranking indicates that the overlay node has better performance for transferring traffic to the server than overlay nodes with lower-rankings (paragraph 38, lines 1-17, Bornstein discloses ranking a route's performance, which is based on its nodes, by using ping data); and

a probing module configured to probe a portion of the overlay nodes with higher-rankings more frequently than overlay nodes with lower-rankings during probing intervals (paragraph 38, lines 17-28, paragraph 43, Bornstein discloses pinging the top performing routes more frequently).

Bornstein does not explicitly teach each overlay node having a performance metric comprising an amount of bandwidth available to reach the overlay node from a probing node and amount of bandwidth available between the overlay node and a target node and wherein an overlay node having a higher amount of available bandwidth has a higher ranking than another overlay node with a lower amount of available bandwidth.

However, Varadarajan teaches available bandwidth between nodes updated to an available bandwidth matrix (paragraphs 39, 50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bornstein in view of Varadarajan to use each overlay node having a performance metric comprising an amount of bandwidth available to reach the overlay node from a probing node and amount of bandwidth available between the overlay node and a target node and wherein an overlay node having a higher amount of available bandwidth has a higher ranking than another overlay node with a lower amount of available bandwidth. One would be motivated to do so because bandwidth is a known performance metric that is used in ranking nodes.

Regarding claim 2, Bornstein teaches the overlay network as recited in claim 1, wherein each overlay node further comprises a path selection module, configured to dynamically select an overlay node with a highest-rankings to be included as part of a pathway for transferring traffic to the server (paragraph 43, lines 1-4).

Regarding claim 4, Bornstein teaches the overlay network as recited in claim 1, further comprising one or more target nodes, configured to transfer the traffic from one

or more of the overlay nodes directly to the server, the one or more target nodes having exclusive knowledge of an identity for the server (paragraphs 38, 43).

Regarding claim 5, Bornstein teaches the overlay network as recited in claim 1, wherein each overlay node is virtually connected to each other (paragraphs 38, 43).

Regarding claim 6, Bornstein teaches the overlay network as recited in claim 1, wherein the performance metric includes at least one of: latency, loss rate, and jitter; and wherein an overlay node with a higher-ranking indicates that the overlay node has better performance for transferring traffic to the server than overlay nodes with lower-rankings, the better performance including at least one of: less jitter, lower latency, and less packet loss (paragraphs 38, 43).

Regarding claim 7, Bornstein teaches the overlay network as recited in claim 1, wherein the ranking module is further configured to determine whether the portion of overlay nodes with higher-rankings continue to have better performance for transferring traffic to the server than one or more of the overlay nodes with lower-rankings after a probing interval (paragraphs 38, 43).

Regarding claim 8, Bornstein teaches the overlay network as recited in claim 1, wherein the ranking module is configured to demote the rankings of the portion of

overlay nodes with higher-rankings to lower-rankings if the portion of overlay nodes with higher-rankings have worse performance for transferring traffic to the server than one or more of the overlay nodes with lower-rankings after a probing interval (paragraphs 38, 43).

Regarding claim 9, Bornstein teaches the overlay network as recited in claim 1, wherein the traffic is data (paragraphs 38, 43).

Regarding claim 17, Bornstein teaches the method as recited in claim 10, comprising determining whether the portion of overlay nodes with higher-rankings continue to have better performance for transferring traffic to a target than one or more of the overlay nodes with lower-rankings after a probing interval; and promoting the rankings of one or more of the overlay nodes with lower-rankings to higher-rankings, if the portion of overlay nodes with higher-rankings have worse performance for transferring traffic to a target than one or more of the overlay nodes with lower-rankings (paragraphs 38, 43).

Claims 10-16 and 18-21 do not teach or define any new limitations above claims 1, 2, 4-9, and 17 and therefore are rejected for similar reasons.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bornstein and Varadarajan further in view of Corrigan et al., U.S. Patent Publication No. 2004/0148357.

As to claim 3, Bornstein and Varadarajan teach the method of claim 1.

Bornstein and Varadarajan do not explicitly teach an access node, configured to authenticate traffic directed to the server from the client, and forward authenticated traffic to one or more of the overlay nodes.

However, Corrigan teaches a messaging gateway for use by mobile networks (see abstract). Corrigan teaches the use of validation nodes (paragraph 51).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bornstein and Varadarajan in view of Corrigan to use an access node, configured to authenticate traffic directed to the server from the client, and forward authenticated traffic to one or more of the overlay nodes. One would be motivated to do so because it guarantees confidentiality and integrity of all traffic.

6. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bornstein further in view of Corrigan et al., U.S. Patent Publication No. 2004/0148357.

Regarding claim 23, Bornstein teaches an overlay network to mitigate a denial of service attack, comprising: target nodes configured to transfer the traffic previously authenticated by the access nodes to the server; and overlay nodes, coupled between the access nodes and the target nodes, configured to route the traffic from the access nodes to the target nodes by selecting a best end-to-end path between the client and the server based in accordance with at least one performance metric, wherein each

overlay node comprises: a ranking module configured to rank the overlay nodes based on the performance metric, wherein an overlay node with a higher-ranking indicates that the overlay node has better performance for transferring traffic to one of the target nodes than overlay nodes with lower-rankings; and a probing module configured to probe a portion of the overlay nodes with higher rankings more frequently than overlay nodes with lower ranking during probing intervals, the ranking module ranking a first overlay node with a first ranking, a second, different overlay, node with a second, lower ranking and a third, different overlay node with a third ranking, that is lower than the second ranking, the probing module probing the first overlay node more often than probing the second overlay node and probing the second overlay node more often than probing the third overlay node (paragraphs 38, 43, 44).

Bornstein does not explicitly teach access nodes configured to authenticate traffic directed to the server from the client.

However, Corrigan teaches the use of validation nodes (paragraph 51).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bornstein in view of Corrigan to use access nodes configured to authenticate traffic directed to the server from the client. One would be motivated to do so because it guarantees confidentiality and integrity of all traffic.

Regarding claim 24, Bornstein teaches the overlay network as recited in claim 23, wherein each overlay node is configured to dynamically select, a best target node for accessing the server and a best path to reach that target node (paragraphs 38, 43).

Regarding claim 25, Bornstein teaches the overlay network as recited in claim 24, wherein the best path is selected via a best next hop measured in terms of the at least one performance metric (paragraphs 38, 43).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 22 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Bornstein et al., U.S. Patent Application Publication No. 2002/0163882.

Regarding claim 22, Bornstein teaches n a network comprising overlay nodes interspersed between a server and client, a system for mitigating against a denial of service attack, the system comprising: at least one overlay node; means for probing overlay nodes in the network during a probing interval to determine connectivity levels of each overlay node; the at least one overlay node comprising means for ranking each overlay node wherein an overlay node having a highest- ranking has a highest connectivity potential for transferring traffic to the server, the means for ranking assigning at least one overlay node with a first, highest ranking at least one other

overlay node with a second ranking that is lower than the first ranking and at least one other overlay node with a third ranking that is lower than the second ranking; means for selecting the overlay node with the highest-ranking to be included as part of a pathway for transferring the traffic to the server; and means for probing a portion of the overlay nodes with higher-rankings more frequently than other overlay nodes during subsequent probing intervals the means for probing using a first timing for probing an overlay node having the first ranking with a first interval between probes, the means for a second timing for probing an overlay node having the second ranking with a second interval between probes, the second interval being longer than the first interval and the means for probing using a third timing probing, an overlay node having the third ranking with a third interval between probes, the third interval being longer than the second interval (paragraphs 38, 43, 44, Bornstein discloses ranking a route's performance, which is based on its nodes, by using ping data, pinging the top performing routes more frequently, and ranking of multiple routes).

Regarding claim 27, Bornstein teaches in an overlay network, a node for maintaining traffic flow between a client and a server during a denial of service attack, the node comprising: a ranking module configured to rank overlay nodes coupled between the client and the server based on a performance metric, wherein overlay nodes with a higher-ranking indicates that the overlay nodes have better performance for transferring traffic to the server than overlay nodes with lower-rankings; and a probing module configured to probe a portion of the overlay nodes with higher-rankings

more frequently than overlay nodes with lower-rankings during probing intervals, the ranking module ranking~ a first overlay node with a first ranking~ a second, different overlay node with a second, lower ranking and a third, different overlay, node with a third ranking that is lower than the second ranking, the probing module probing the first overlay node more often than the second overlay node and probing the second overlay node more often than the third overlay node (paragraphs 38, 43, 44).

Response to Arguments

9. Applicant's arguments with respect to claims 1-25 and 27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Pat. No. 5,539,659 to McKee et al., because it discloses ranking of nodes.

U.S. Pat. No. 5,802,503 to Sansone, because it discloses nodes that are ranked and weighted.

U.S. Pat. Publication No. 2002/0002686 to Vange et al., because it discloses a method and system for overcoming denial of service attacks.

U.S. Pat. No. 7,185,077 to O'Toole et al., because it discloses performance metrics of a network and an overlay network of nodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AVI GOLD whose telephone number is (571)272-4002. The examiner can normally be reached on M-F 8:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on 571-272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. G./
Examiner, Art Unit 2457

/ARIO ETIENNE/
Supervisory Patent Examiner, Art Unit 2457